COMMENTARY

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Commentary on: Are we overpathologizing everyday life? A tenable blueprint for behavioral addiction research

On the slippery slopes: The case of gambling addiction

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Billieux et al. (2015) propose that the recent proliferation of behavioral addictions has been driven by deficiencies in the underlying research strategy. This commentary considers how pathological gambling (now termed gambling disorder) traversed these challenges to become the first recognized behavioral addiction in the DSM-5. Ironically, many similar issues continue to exist in research on gambling disorder, including question-marks over the validity of tolerance, heterogeneity in gambling motives, and the under-specification of neuroimaging biomarkers. Nevertheless, I contend that the case for gambling disorder as a behavioral addiction has been bolstered by the existence of clear and consistent functional impairment (primarily in the form of debt), coupled with the development of a public health approach that has given emphasis to product features (i.e. the structural characteristics of gambling forms) as much as individual dispositions (the 'addictive personality').

Keywords: pathological gambling, video games, addiction, tolerance, neuroimaging, structural features

Billieux, Schimmenti, Khazaal, Maurage and Heeren (2015) articulately explain how the recent proliferation of soft behavioral addictions could arise from a circular research approach, involving 3 stages. The first step is the derivation of a screening tool, based on adapting established criteria for substance use disorders. The second step is the confirmation in epidemiological datasets that some prevalence of the putative addiction exists in the general population. The third step is the testing for neurocognitive markers in the putative addiction, when those markers are themselves derived from the same essential criteria (albeit in substance use disorders). The widespread emergence of this approach has likely been fueled by the ratification of 'behavioral addiction' via the case of gambling disorder (previously termed pathological gambling) in the DSM-5 (Petry et al., 2014).

Billieux et al. (2015) imply that this current conceptualization of gambling disorder was validated by "decades of empirical research". Reading their article, I was prompted to reconsider how (or indeed whether) gambling disorder successfully overcame these hurdles that other putative behavioral addictions now face. Certainly, similar controversy existed around the time that the DSM-III introduced the pathological gambling diagnosis in 1980 (Lesieur, 1984). Indeed, when taken in isolation, many specific lines of evidence in gambling disorder remain open to criticisms analogous to those raised by Billieux et al. (2015). I will consider three examples. First, Billieux et al. (2015) question the validity of tolerance in behavioral addictions. Tolerance is often regarded as one of the hallmarks of an addiction syndrome (Shaffer et al., 2004). In the case of gambling, individuals with gambling disorder clearly play with progressively larger sums of money over time, and many screening instruments include an item that refers to escalating bet size. However, this effect may have a distinct motivation from the phenomenon in substance use disorders, where an opponent process causes the addicted individual to require higher doses of drug to achieve the same subjective effect. In gambling disorder, it is not clear that the increasing wagers are necessary for need satisfaction; an accumulation of debt may entirely justify the need to escalate one's bet (Blaszczynski, Walker, Sharpe & Nower, 2008).

Second, Billieux et al. (2015) propose that a common symptom presentation (e.g. of multiplayer online game addiction) can arise from profoundly different psychological motives. Such heterogeneity in motives clearly also exists in gambling disorder. Factor analytic studies differentiate coping motives (gambling to escape), enhancement motives (gambling for excitement) and socializing motives (Stewart & Zack, 2008), with some dispute over the place of money as a motivating factor (Flack & Morris, 2014). Different preferred forms of gambling and mental health co-morbidities may align with these motives (Blaszczynski & Nower, 2002) with implications for treatment tailoring.

Third, the search for biomarkers for gambling disorder has entered an interesting phase. Using functional MRI, a substantial number of studies have focused attention on the 'brain reward system' (centered on the ventral striatum and medial prefrontal cortex) but the direction of group differences in these regions is inconsistent (Limbrick-Oldfield, Van Holst & Clark, 2013). A similar number of studies describe over- and under-activity in groups with gambling disorder; results tend to be interpreted with two distinct

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theoretical positions, reward deficiency versus incentive salience (Leyton & Vezina, 2013). PET data looking at brain neurochemistry are even stranger, where dopamine tracers yield little overlap in the signature of gambling disorder and substance use disorders (Boileau et al., 2014; Clark et al., 2012). One possibility is that the effects in substance use disorders are drug-induced (e.g. cocaine neurotoxicity). Another distinct possibility is that the biomedical model of addictions represent an over-simplification in the case of gambling disorder (c.f. Hall, Carter & Forlini, 2015; Nutt, Lingford-Hughes, Erritzoe & Stokes, 2015).

One salient riposte to these debates comes in the form of functional impairment. For clinicians, this point goes without saying; clients do not present to services seeking help without some form of functional impairment (this may be perceived by family or the legal system rather than directly by the individual). In the case of gambling disorder, financial debt is ubiquitous, crippling, and pernicious, drawing friends and family quickly into the spiral of harms. It is not uncommon for individuals with gambling disorder to become homeless, attempt suicide or resort to crime, as direct responses to their mounting debts (Clark & Walker, 2009; Manning et al., 2015; Sharman, Dreyer, Aitken, Clark & Bowden-Jones, 2015). These objective harms contrast with the subjective, transient and contextual distress that is often described for other putative behavioral addictions.

A public health model provides a further perspective, by emphasizing how harms arise through the interaction of individual risk factors and features of the addictive agent (Korn & Shaffer, 1999). In the specific case of gambling, this can be expressed as the interplay of the 'gambler and the game', or the 'player and the product' (Clark, 2014). The addictions framework is grounded in a biomedical model that may give disproportionate weight to individual vulnerabilities, which effectively aims to characterize the 'addictive personality' in neurobiological and psychological terms. But within this framework – and in the continued absence of clear biomarkers – any excessive behavior can be considered an addiction, and thus the slippery slope beckons. By understanding how product features act on the consumer, this may help impose some thresholds on the slippery slope. In the case of drug addiction, it is clear for example that the addictive potential of tobacco is vastly different when nicotine is administered in the form of cigarettes as opposed to chewing tobacco (Edwards, 2005). In the case of gambling games, various structural characteristics have been identified, such as speed of play (Chóliz, 2010), near-miss features (Clark, Lawrence, Astley-Jones & Gray, 2009) or illusion of control devices (Ladouceur & Sevigny, 2005). There is increasing evidence that at least some of these features are linked to the addictive potential of different forms of gambling, and modulate brain activity in the same regions affected by individual vulnerability factors.

A similar approach is proving fruitful in the case of video gaming (especially online gaming). Some features are shared across gambling games and video games (e.g. reinforcement schedules), while others are specific (e.g. advancement of the avatar in video games) (King, Delfabbro & Griffiths, 2009). In the case of 'food addiction' or binge eating, it may also be possible to relate sugar, salt or fat content of foods to behavioral models of consumption in a way that at least generates a tractable program of research and falsifiable hypotheses (Avena, Gearhardt, Gold, Wang & Potenza, 2012; Ziauddeen, Farooqi & Fletcher, 2012). It is less convincing whether or how such product features should be conceptualized for other putative behavioral addictions, such as 'work addiction' or 'tango addiction'. Thus, and in conclusion, any blueprint for behavioral addictions research would benefit from an increased emphasis on the psychological properties of addictive products.

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